NOAA Fleet Update

June 2019

The following update provides the status of NOAA's fleet of ships and aircraft, which play a critical role in the collection of oceanographic, atmospheric, hydrographic, and fisheries data. NOAA's current fleet of 16 ships – the largest civilian research and survey fleet in the world – and nine aircraft, are operated, managed, and maintained by NOAA's Office of Marine and Aviation Operations (OMAO). OMAO includes civilians, mariners, and officers of the United States NOAA Commissioned Officer Corps (NOAA Corps), one of the nation's seven Uniformed Services.

Table of Contents

OMAO in the News

NOAA Ship *Ronald H. Brown* rendezvous with French adventurer traveling solo across the Atlantic Ocean in a barrel. May 8, 2019; The Washington Post. In early May, French adventurer, Jean-Jacques Savin, completed his 127-day drift across the Atlantic Ocean. The only human contact he experienced during the voyage was a chance encounter with NOAA Ship *Ronald H. Brown*, which reprovisioned him late in his longer-than-expected journey.

French adventurer Jean-Jacques Savin receiving provisions from NOAA Ship *Ronald H. Brown*.
[Photo Credit: NOAA]

Mysterious shipwreck from mid-1800s found by accident during NOAA equipment test. May 29, 2019; Charlotte Observer. Scientists aboard NOAA Ship *Okeanos Explorer* discovered a previously unknown shipwreck while testing equipment on May 16.

19th century shipwreck discovered by NOAA Ship *Okeanos Explorer* in May.
[Photo Credit: NOAA]

NOAA's P-3 Orion, a Hurricane Hunter, in Salina, Kansas to research tornado formation. May 14, 2019; Salina Post. One of NOAA's WP-3D Orions is deployed to Salina, Kansas to support TORUS (Targeted Observations by RADARs and UAS of Supercells.)

"NOAA42" WP-3D Orion, tracks a tornado in support of the TORUS field project.
[Photo Credit: Salina Airport Authority]

NOAA Teams Departing for Expedition to Papahanaumokuakea Marine National Monument. May 14, 2019; Honolulu Star Advertiser. NOAA Ship *Oscar Elton Sette* is supporting the annual multi-agency mission to Papahanaumokuakea. Among this year's priorities will be researching how animals have responded to the loss of East Island at French Frigate Shoals, which was washed away by Hurricane Walaka in October 2018.

A small boat assists setting up field camps on Laysan Island (Kamole).
[Photo Credit: NOAA]

NOAA Hurricane Hunters help victims from the sky with aerial imagery. May 25, 2019; WFLA-TV. Before and during the storm, the NOAA Hurricane Hunter fleet of aircraft played a pivotal role in tracking and forecasting Hurricane Michael. After the storm made landfall, a multi-purposed NOAA aircraft, the twin-engine King Air Beechcraft carried out a different critical task.

Post-Hurricane Michael imagery of Mexico Beach, FL. October 11, 2018.
[Photo Credit: NOAA]

NOAA Commissioned Officer Corps

OMAO and the NOAA Corps are an integral part of NOAA and our officers operate OMAO's research and survey fleet of 16 ships and nine aircraft. Mission areas can range from launching a weather balloon at the South Pole, conducting hydrographic or fishery surveys in Alaska, maintaining buoys in the tropical Pacific, flying snow surveys over the Midwest, or flying our "Hurricane Hunter" aircraft into, or above, hurricanes.

Applications Being Accepted and interview status

Applications for BOTC 135 will be accepted until June 6, 2019 and the interview process will take place until June 28, 2019. Also, applications were accepted for Inter-Service Transfer (IST) applicants for the positions of P-3 pilots, P-3 navigators as well as small aircraft until June 1, 2019. Both BOTC 135 and the IST boards are expected to convene at the end of July. Additional information may be found on the NOAA Corps website.

Recruiting Events

The recruiting team is preparing for a heavy fall recruiting season to begin August 2019.

BOTC 133

[Photo Credit: NOAA]

Basic Officer Training Class 133

After 17 challenging weeks of training, BOTC 133 graduated alongside Coast Guard OCS 2-19 on May 7th. The final weeks of the program included underway training aboard vessels *Kittiwake* and *Enviro Lab III*, leadership philosophy presentations, the third health and physical readiness exam, and briefings on many topics to prepare the newly minted ensigns for the transition to their first operational unit. The class welcomed multiple distinguished guests for graduation, including the class sponsor, RDML Nancy Hann, and the Commandant of the Coast Guard, ADM Karl Schulz, who delivered some very inspiring remarks. After four days of special liberty with family and friends, the class reconvened in Pascagoula, MS for a capstone cruise aboard NOAA Ship *Gordon Gunter.* A five-day class in Bridge Resource Management rounded out their time at the training center. The 12 new ensigns detached from the NOAA Corps Officer Training Center on Friday, May 24th and are on their way to meet their ships and aircraft.

BOTC 133 takes the oath of office alongside their Coast Guard shipmates, administered by RDML Brian Penoyer, Director of Coast Guard Force Readiness Command.

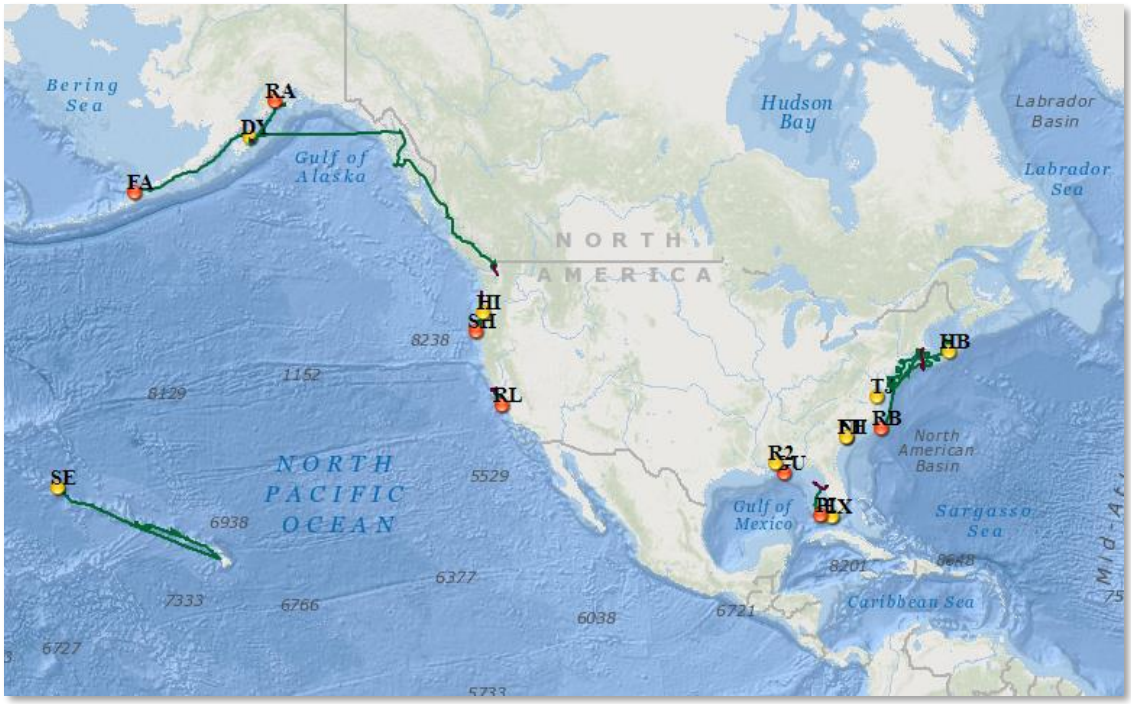
[Photo Credit: NOAA Corps Officer Training Center, NOAA]

OMAO's Ships and Centers

OMAO's Ship Tracker shows information about the location - present and past - of our fleet of research and survey ships. Please note: To access Ship Tracker you must have an account with a .gov or .mil email address. All other access is restricted.

OMAO's ships and related Marine Centers are listed below based on the geographical location of the vessels' homeports starting in the Northeast and ending in the Pacific.

The 35-day lapse in appropriations greatly affected ship schedules, ship maintenance, and required crew training to varying degrees. A revised Fleet Allocation Plan has now been signed off on and operations have begun for most ships. The dedicated employees of OMAO have either started or are looking forward to a safe and productive field season.



NOAA Ship locations at the start of June, 2019.
[Photo Credit: NOAA]

National

OMAO'S MARINE OPERATIONS

Director of Marine Operations: Mr. Troy Frost

OMAO's Marine Operations oversees the operations of OMAO's ships and the three regional Centers, including the Marine Operations Center-Pacific, Marine Operations Center-Atlantic, and Marine Operations Center-Pacific Islands. Employees of Marine Operations are stationed nationwide to provide strategic, administrative, engineering, maintenance, electronic, budgetary, and personnel support to the OMAO fleet. Each year these ships conduct dozens of missions to assess fish and marine mammal stocks, conduct coral reef research, collect seafloor data to update nautical charts, and explore the ocean.

New Castle, New Hampshire

NOAA Ship *Ferdinand R. Hassler*
Commanding Officer: Lieutenant Commander Mark Blankenship
Primary Mission Category: Hydrographic Surveys
In Port: Brooklyn, New York
Ship Status: Alongside shipyard in Brooklyn, New York, planned departure 6/2019.

Newport, Rhode Island

NOAA Ship *Henry B. Bigelow*
Commanding Officer: Captain William Mowitt
Primary Mission Category: Fisheries Research
Depart: Newport, Rhode Island
Arrive: Newport, Rhode Island
Ship Status: Underway for Northeast Ecosystem Monitoring to assess the hydrographic, planktonic and pelagic components of the Northeast U.S. Continental Shelf Ecosystem until 6/6/2019. Starting 6/14/2019, underway for Northeast Deep Water Coral Habitats to measure the abundance of benthic invertebrates and characterize spatial patterns in benthic ecosystem structure.

NOAA Ship *Henry B. Bigelow*
[Photo Credit: NOAA]

Davisville, Rhode Island

NOAA Ship *Okeanos Explorer*

Commanding Officer: Commander Eric Johnson
Primary Mission Category: Oceanographic Exploration and Research
Depart: Key West, Florida
Arrive: Cape Canaveral, Florida
Ship Status: Underway for ASPIRE South Atlantic Bight ROV and Mapping to perform deep sea mapping operations within the U.S. EEZ. A Change of Command ceremony will be held on June 16th where Commander Eric Johnson will be relieved by Commander Nicole Manning.

Norfolk, Virginia

NOAA Ship *Thomas Jefferson*

Commanding Officer: Commander Briana Hillstrom
Primary Mission Category: Hydrographic Surveys
In Port: Brooklyn, New York
Ship Status: Alongside shipyard in Brooklyn, New York, planned departure 6/2019.

OMAO'S MARINE OPERATIONS CENTER – ATLANTIC (MOC-A)

Commanding Officer: Captain David Zezula
MOC-A serves as homeport for NOAA Ship *Thomas Jefferson*. Its personnel provide administrative and logistical support and manage the day-to-day operations for the research and survey ships in NOAA's Atlantic and Gulf of Mexico fleet of nine vessels. Each year, these ships conduct dozens of missions, to assess marine ecosystems including fish and marine mammal stocks, coral reef research, collect seafloor data to update nautical charts, and explore the ocean.

OMAO's Marine Operations Center – Atlantic in Norfolk, Virginia.
[Photo Credit: NOAA]

Charleston, South Carolina

NOAA Ship *Nancy Foster*
Commanding Officer: Lieutenant Commander James Brinkley
Primary Mission Category: Oceanographic Research, Environmental Assessment
Depart: Charleston, South Carolina
Arrive: St. Thomas, U.S. Virgin Islands
Ship Status: Underway for Coral Reef Ecosystem Research to conduct annual fisheries oceanography surveys of economically important reef fish species in the US Caribbean and the surrounding region.

NOAA Ship *Nancy Foster*
[Photo Credit: Lieutenant Connor Maginn, NOAA]

NOAA Ship *Ronald H. Brown*
Commanding Officer: Captain Daniel Simon
Primary Mission Category: Oceanographic Research, Environmental Assessment
Depart: Charleston, South Carolina
Arrive: Charleston, South Carolina
Ship Status: Underway for Dynamic Positioning Sea Trials and Office of Coast Survey (OCS) mapping.

Pascagoula, Mississippi

NOAA Ship *Pisces*
Commanding Officer: Commander Patrick Murphy
Primary Mission Category: Fisheries Research
Depart: Mayport, Florida
Arrive: Mayport, Florida
Ship Status: Underway for U.S. South Atlantic Marine Protected Area Survey to assess the efficacy of the Marine Protected Area as a management tool to protect species of the snapper grouper complex and *Oculina* coral. This mission will also investigate two additional spots of interest: Devil's Hole Spawning Management

Zone and Cape Lookout.

NOAA Ship *Pisces*

[Photo Credit: NOAA]

NOAA Ship *Oregon II*

Commanding Officer: Master David Nelson

Primary Mission Category: Fisheries Research

Depart: Galveston, Texas

Arrive: Galveston, Texas

Ship Status: Underway for Southeast Area Monitoring and Assessment Program (SEAMAP) Summer Groundfish in the Gulf of Mexico. The objective of this project is to sample the northern GOM with standard trawl sampling gear to determine the abundance and distribution of benthic fauna.

NOAA Ship *Gordon Gunter*

Commanding Officer: Lieutenant Commander Christopher Skapin

Primary Mission Category: Fisheries Research

Depart: Pascagoula, Mississippi

Arrive: Pascagoula, Mississippi

Ship Status: Underway for Gulf of Mexico Bryde's Whale survey to collect data related to the Gulf of Mexico Bryde's whale and its habitat using a variety of techniques, including photogrammetry via small Unoccupied Aerial System (sUAS), handheld cameras, skin and blubber biopsies, recoverable short-term acoustic and/or video recording tags, non-recoverable satellite position tags, eDNA collection, visual observation, near bottom mid-water trawls and extensive fisheries acoustic surveys (ER80).

San Diego, California

NOAA Ship *Reuben Lasker*

Acting Commanding Officer: Commander Chad Cary
Primary Mission Category: Fisheries Research
Depart: San Francisco, California
Arrive: San Diego, California
Ship Status: Underway conducting Juvenile Rockfish Survey followed by West Coast Pelagic Fish Survey. The Juvenile Rockfish Survey supports the study of the marine environment off the coast of California for rockfish and groundfish stock assessment models that inform fisheries management as well as, provide data for ecosystem and forage species studies. The West Coast Pelagic Fish Survey provides data primarily on populations of sardines and anchovies with a secondary focus on mackerel and jack mackerel stocks.

NOAA Ship *Reuben Lasker* underway on California Cooperative Oceanic Fisheries Investigation Project
[Photo Credit: NOAA]

Newport, Oregon

NOAA Ship *Rainier*

Commanding Officer: Commander Benjamin Evans
Primary Mission Category: Hydrographic Surveys
Depart: Seward, Alaska
Arrive: Kodiak, Alaska
Ship Status: Underway in support of hydrographic survey projects near and around Kodiak, Alaska. The port of Kodiak has become the second busiest seaport in Alaska. The primary area of concern is Chiniak Bay last surveyed in 1933. This survey will provide up to date data for navigation highlighting hazards such as underwater pinnacles. En route to Kodiak, the ship will survey Lisianski Strait last surveyed in 1917. This strait has become heavily trafficked by Alaska Marine Hwy, tug traffic, and numerous recreational vessels.

NOAA Ship *Rainier* transiting through Lisianski Inlet, AK.
[Photo Credit: Lieutenant Scott Broo, NOAA]

NOAA Ship *Bell M. Shimada*

Commanding Officer: Captain Arthur Stark

Primary Mission Category: Fisheries Research

Depart: Newport, Oregon

Arrive: Newport, Oregon

Ship Status: Underway for Juvenile Salmon and Ocean Ecosystems Survey followed by the Integrated Ecosystem and Pacific Hake Acoustic Trawl Survey. JSEOS project documents the distribution, condition, and ecology of juvenile salmon along the continental shelf of Washington and Oregon. The Integrated Ecosystem and Pacific Hake Acoustic Trawl Survey is a combined U.S.-Canada integrated acoustic and trawl survey of Pacific hake and Coastal Pelagic Fishes to assess the biomasses, distributions, and biological compositions in U.S. and Canadian waters off the Pacific coast.

NOAA Ship *Bell M. Shimada* departs Newport for JSEOS Leg 1.
[Photo: Lieutenant Commander Tim Sinquefield, NOAA]

OMAO'S MARINE OPERATIONS CENTER – PACIFIC (MOC-P)

Commanding Officer: Captain Michael Hopkins

MOC-P serves as a homeport for two NOAA ships. Its personnel provide administrative and logistical support, and manage the day-to-day operations, for the research and survey ships in NOAA's Pacific fleet. Each year, these ships conduct dozens of missions to assess fish and marine mammal stocks, conduct coral reef research, collect seafloor data to update nautical charts, and explore the ocean. MOC-P also serves as the home of OMAO's Marine Operations.

Two visitors: The R/V Atlantis from WHOI and an osprey perching on MOC-P pier.
[Photo: Lisa Evans, NOAA]

Ketchikan, Alaska

NOAA Ship *Fairweather*

Commanding Officer: Commander Marc Moser

Primary Mission Category: Hydrographic Surveys

Depart: Dutch Harbor, Alaska

Arrive: Dutch Harbor, Alaska

Ship Status: Underway for hydrographic surveys in Bristol Bay, Alaska primarily in vicinity of Cape Newenham and Cape Pierce. Much of the hydrographic data for this area was collected in the 1920s. Updated data will help support maritime commerce required to support industry and commerce in these communities.

Kodiak, Alaska

NOAA Ship *Oscar Dyson*

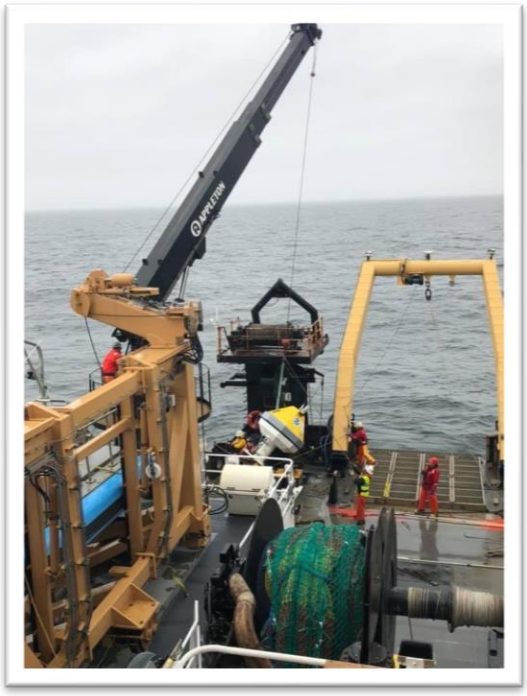
Commanding Officer: Commander Sarah Duncan

Primary Mission Category: Fisheries Research

Depart: Kodiak, Alaska

Arrive: Kodiak, Alaska

Ship Status: Underway for Walleye Pollock Gulf of Alaska Summer Survey. This research is focused on improving forecasts and removing uncertainty for stock assessment models principally for walleye, pollock and other mid-water commercial fish species in the Gulf of Alaska. The study is accomplished with acoustic data, trawling operations, and fisheries oceanographic data collection.



NOAA Ship *Oscar Dyson* servicing PMEL ITAE moorings in the Bering Sea.
[Photo Credit: Commander Sarah Duncan, NOAA]

Honolulu, Hawaii

NOAA Ship *Hi'ialakai*
Commanding Officer: Commander Colin Little
Primary Mission Category: Oceanographic Research, Environmental Assessment
In port: Newport, Oregon
Ship Status: The ship is currently alongside at MOC-P in a layup status.

NOAA Ship *Oscar Elton Sette*
Commanding Officer: Commander Héctor Casanova
Primary Mission Category: Fisheries Research
Departure: Honolulu, Hawaii
Arrival: Honolulu, Hawaii
Ship Status: Underway for Monk Seal Deployment - During this project biologists monitor the status of monk seals at remote locations in the Northwestern Hawaiian Islands. The ship's next project is the Main Hawaiian Islands Life History Research. The focus of that project is to conduct fishery-independent life history and ecological research on the biological dynamics of commercially important deep-water bottomfishes in the Main Hawaiian Islands.

NOAA Ship *Oscar Elton Sette* off the coast of Maui
[Photo Credit: Raymond Boland, NOAA]

OMAO'S MARINE OPERATIONS CENTER – PACIFIC ISLANDS (MOC-PI)

Commanding Officer: Commander Jeffrey Shoup

MOC-PI serves as a homeport for two NOAA ships. Its personnel provide administrative and logistical support, and manage the day-to-day operations for the ships in NOAA's Pacific Islands fleet and for ships operating in the western Pacific. Each year, these ships conduct dozens of missions to assess fish and marine mammal stocks, conduct coral reef research, collect seafloor data to update nautical charts, and explore the ocean.

NOAA's MOC-PI (Ford Island; Honolulu, Hawaii) with NOAA ship Oscar Elton Sette alongside
[Photo Credit: Lieutenant (Junior Grade) Christopher Gallagher, NOAA]

OMAO's Aircraft

Lakeland, Florida

NOAA's fleet of nine manned aircraft is based at OMAO's Aircraft Operations Center (AOC). Located at Lakeland Linder Regional Airport in Lakeland, Florida, the officers, crew, and scientists from AOC provide capable, mission-ready aircraft and professional crews to the scientific community. AOC is committed to the safe, efficient and economical use of NOAA aircraft and has more than four decades of experience developing, coordinating and successfully and safely conducting airborne environmental data gathering missions. OMAO's aircraft fleet includes the following platforms and the web links provide additional photos, information on each aircraft, and the missions they serve:

P-3 "Hurricane Hunter" [Tail ID# N42RF]

The aircraft supported the East Coast Hurricane Awareness Tour in May in the following cities: Quonset, Rhode Island; Harrisburg, Pennsylvania; Roanoke, Virginia; Charlotte, North Carolina; and, Brunswick, Georgia.

Who: Officers and crew of OMAO/NOAA Corps along with scientists from NOAA's Office of Atmospheric Research (OAR), National Severe Storms Laboratory
What: TORUS (Targeted Observations by Radars and UAS of Supercells)
When: Present - June 26
Where: Salina, Kansas
Why: The aircraft will support research teams that will follow severe thunderstorms to study how factors like wind speed, temperature, humidity and pressure may reveal the small-scale structures in a supercell storm and how it contributes to tornado formation. The goal is to use the data collected to improve conceptual models of supercell thunderstorms. Aims of the project include measuring and observing the frequency of changes in the atmosphere and relationships between the different atmospheric boundary layers.

NOAA P-3
[Photo Credit: Michael Mascaro, NOAA]

P-3 "Hurricane Hunter" [Tail ID# N43RF]

Instrumentation and outfitting will continue at AOC until operationally-ready on July 1. The aircraft will be research mission-ready on July 15.

G-IV "Hurricane Hunter" [Tail ID# N49RF]

The aircraft is supporting the inaugural Pacific Hurricane Awareness Tour in Honolulu, HI on June 1.

Who: Officers and crew of OMAO/NOAA Corps along with scientists from NOAA's National Ocean Service (NOS), National Geodetic Survey (NGS) Grav-D Program

What: Gravity for the Redefinition of the American Vertical Datum (GRAV-D)

When: Present - June 28

Where: Honolulu, Hawaii. The aircraft will conduct flights over U.S. Pacific Island territories.

Why: Grid pattern flight lines will be flown at 20,000 feet while collecting GPS and inertial data to update the U.S. vertical datum. A vertical datum is a base measurement point (or set of points) from which all elevations are determined.

NOAA G-IV

[Photo Credit: NOAA]

King Air [Tail ID# N68RF]

Who: Officers and crew of OMAO/NOAA Corps along with scientists from the NOS, NGS Coastal Mapping Program

What: Coastal mapping flights

When: Present - July 1

Where: TBD based on weather and tide stages.

Why: These flights provide critical baseline data to help accurately map the U.S. shoreline. The data are important for national security, maritime shipping, and navigation.

NOAA King Air

[Photo Credit: NOAA]

Jet Prop Commander [Tail ID# N45RF]

Who: Officers and crew of OMAO/NOAA Corps along with scientists from the NOS, NGS Grav-D Program

What: GRAV-D

When: Present - September 15

Where: Ontario, California; Reno, Nevada; and Grand Junction, Colorado. The aircraft will conduct flights over southern Nevada and California.

Why: Grid pattern flight lines will be flown at 20,000 feet over the Southwest United States while collecting GPS and inertial data to update the U.S. vertical datum. A vertical datum is a base measurement point (or set of points) from which all elevations are determined.

Jet Prop Commander

[Photo Credit: NOAA]

Twin Otter [Tail ID# N46RF]

Who: Officers and crew of OMAO/NOAA Corps along with scientists from NMFS, Southeast Fisheries Science Center (SEFSC)

What: Southeast Atlantic Marine Assessment Program for Protected Species (AMAPPS)

When: Present - June 29

Where: St. Simons Island, Georgia

Why: Improved information is needed on living marine resource abundance, distribution, habitat use, and behavior in the Atlantic Ocean to properly mitigate and monitor for potential impacts of human activities, including those related to offshore energy development.

Twin Otter [Tail ID# N48RF]

Who: Officers and crew of OMAO/NOAA Corps along with scientists from the NOS, NGS Coastal Mapping Program

What: Coastal mapping flights

When: Present - July 15

Where: TBD based on weather and tide stages.

Why: These flights provide critical baseline data to help accurately map the U.S. shoreline. The data are important for national security, maritime shipping, and navigation.

Twin Otter [Tail ID# N56RF]

Who: Officers and crew of OMAO/NOAA Corps along with scientists from NOAA's National Marine Fisheries Service (NFMS), Alaska Regional Office (ARO).

What: Alaska Harbor Seals

When: Present - June 17

Where: Dutch Harbor, Adak and Shemya, Alaska.
Why: As part of the Marine Mammal Protection Act, the purpose of this project is to monitor the western population stock and recovery efforts of Harbor Seals from Endangered Species status.

Who: Officers and crew of OMAO/NOAA Corps along with scientists from NFMS, ARO.
What: Alaska Steller Sea Lions
When: June 21 - July 12
Where: Sitka, Kodiak, and Homer, Alaska
Why: As part of the Marine Mammal Protection Act, the purpose of this project is to monitor the western population stock and recovery efforts of Steller Sea Lions from Endangered Species status.

Twin Otter, N56RF, observing sea ice coverage in the Chukchi Sea, northwest of Alaska, in May.
[Photo Credit: NOAA]

Twin Otter [Tail ID# N57RF]

Who: Officers and crew of OMAO/NOAA Corps along with scientists from NMFS, NEFSC
What: Northeast North Atlantic Right Whale Surveys
When: Present - September 12
Where: Cape Cod, Massachusetts
Why: The objectives of this project are to provide real time sighting information to commercial shipping interests in an effort to reduce ship collisions, to better understand the distribution and abundance, and to collect photographic images of the critically endangered North Atlantic Right Whales. With as few as 400 remaining, surveillance flights to track their migration patterns are important for conservation and recovery efforts.

Twin Otter
[Photo Credit: NOAA]

Unmanned Aerial System (UAS) Section

The UAS Section provides nationwide policy input, oversight, and guidance for all of NOAA's UAS operations. The UAS Section of AOC is staffed by a team of aviation professionals who specialize in operational UAS implementation. The UAS Section tracks all small UAS (sUAS) operations for NOAA to include aircraft hours, types, pilot qualifications, and pilot training. The UAS Section also coordinates airspace approvals for operations within the United States National Airspace System, special use airspace, and foreign airspace. AOC conducts a thorough review of all projects by applying established risk management procedures to UAS missions, including an airworthiness review of all aircraft. This support is provided to NOAA Line Offices and partners to further develop and refine the use of sUAS for NOAA's research and data collection.

OMAO'S AIRCRAFT OPERATIONS CENTER (AOC)

Commanding Officer: Captain Timothy Gallagher

The AOC, located at Lakeland Linder Regional Airport in Lakeland, Florida, serves as the main base for OMAO's fleet of nine aircraft and provides capable, mission-ready aircraft and professional crews to the scientific community. Whether studying global climate change or acid rain, assessing marine mammal populations, surveying coastal erosion, investigating oil spills, flight checking aeronautical charts, or improving hurricane prediction models, the AOC flight crews continue to operate in some of the world's most demanding flight regimes.

AOC personnel and aircraft in the hangar at the NOAA Aircraft Operations Center in Lakeland, Florida
[Photo Credit: NOAA]

Unmanned Systems Support

Nationwide

APH-22 Hexacopter

Location: Muskeget Island, Massachusetts
Mission: NEFSC Muskeget Grey Seal Pupping Survey
The Northeast Fisheries Science Center has been approved to conduct survey flights over Grey Seal colonies. Images collected will be used to assess Grey Seal health and population.

Location: Oahu, Hawaii
Mission: PIFSC APH-22 Training
The Pacific Islands Fisheries Science Center utilizes the location at the Kawainui Model Airplane Field to conduct training and proficiency flights. This allows APH-22 operators to maintain proficiency for future operations at a reduced cost. Training flights are also approved from NOAA small boats.

Location: Sea Life Park and Dolphin Quest Oahu, Hawaii
Mission: PIFSC Cetacean Research Program
Images taken by the APH-22 are used to collect photogrammetric measurements of captive cetaceans. Photogrammetric measurements are compared with the known manual measurements to determine accuracy. Consistent trade winds can make image collection difficult. Practices found to improve image quality and accuracy can be used to improve operations over wild populations.

APH-22 Hexacopter/APH-28 Hexacopter

Location: Western Regional Center, NOAA Campus, Seattle, Washington
Mission: AFSC Training Site
Alaska Fisheries Science Center has been approved to conduct proficiency training, manufacturer training, and payload calibration flights at the Western Regional Center-Seattle, NOAA Campus. These flights will allow AFSC to remain proficient and prepare for upcoming projects.

Location: Atlantic Northeast
Mission: NEFSC Right Whale Cruise
Northeast Fisheries Science Center will be conducting flights in class G air space in offshore waters during the month of May. Flights will be conducted from a 90 foot research vessel or an 18 foot small boat launched from the vessel to collect aerial images of North Atlantic Right Whales.

Location: Gulf of Mexico
Mission: NEFSC Brydes Whale
Flights will be conducted off NOAA Ship *Gordon Gunter* in the Gulf of Mexico to collect aerial images of Brydes Whales.

APH-22 Hexacopter/APH-28 Hexacopter/APO-42 Octocopter

Location: Jamul, Californina

Mission: Jamul BLM Area
Southwest Fisheries Science Center has been approved to conduct training and proficiency flights in Jamul, California. This training site is owned by US Fish and Wildlife. This will allow pilots to practice landing, following a target, and approaching to collect blow samples.

Location: Puget Sound, Washington
Mission: Southern Resident Killer Whale Condition
Southwest Fisheries Science Center will be conducting flights to collect images of Southern Resident Killer Whales to assess changes in body condition and growth of individual whales. Images and blow samples may also be collected from Humpback and Grey Whales. Flights will be conducted from a 31 foot catamaran.

SenseFly eBee RTK

Location: Muskeget Island, Massachusetts
Mission: NMFS/RSD Grey Seal Habitat
Sensefly Ebee will be used to conduct Grey Seal habitat mapping and population assessment flights over Muskeget Island.

FireFLY6 PRO

Location: Oahu, Hawaii
Mission: PIFSC Proficiency Training
The Kawainui model airplane field will be used monthly to perform proficiency flights for PIFSC operators. The main objective will be to practice hand launches, recoveries and locating targets. These flights are essential in providing the necessary skills needed for successful operations.

3DR Solo

Location: MOC-P aboard NOAA Ship *Bell M. Shimada*
Mission: Public Outreach and ship inspection
The UAS will proceed to take aerial photographs from the MOC-P pier and the deck of *Bell M. Shimada*. An FAA COA has been granted for operations in the Class E airspace around MOC-P. AOC has received and installed updated software that will allow marine based UAS operations. An updated Solo has been shipped to *Bell M. Shimada*.

HQ-55 Latitude

Location: Lakeland, Florida
Mission: Research
The HQ-55 Latitude is a new vehicle currently in development for NOAA. This new vehicle conducted sea trials from NOAA Ship *Ronald H. Brown* in May 2019. The aircraft is currently being proposed for the project 'Atomic 2020' in January-February 2020.

Blackswift S-2/Meteodrone SSE

Location: Oak Ridge, Tennessee

Mission: Calibration and Proficiency
ATDD is approved to use the Knox County Radio Control Society (KCRC) and the House Mountain Radio Control Field (HMRC) sites to conduct calibration and vertical profile flights up to 1200 feet above ground level (AGL) These flights will allow ATDD to test and calibrate scientific instruments before use on their upcoming projects.

Blackswift S-2/Meteodrone SSE/MD4-1000

Location: Oak Ridge, Tennessee
Mission: Instrument Testing and Calibration
Blackswift S-2 and Meteodrone SSE will be used to conduct flights to calibrate and test scientific equipment. The MD4-1000 will be used to perform LIDAR measurements of the terrain. Flights will be conducted to up to 1200'AGL at Oliver Springs Airport with the permission of the airport manager.

A team of NOAA research launches a sUAS
[Photo Credit: NOAA]

OMAO Partnerships

OMAO and the NOAA Commissioned Officer Corps provide key services and leadership to a number of federal agencies and external partners to help them meet their mission – and ours – and to better leverage federal resources.

United States House of Representatives - Natural Resource Committee

Location: Washington, District of Columbia
Detail: Lieutenant Commander Zachary Cress
Lieutenant Commander Cress is currently on detail with the staff to the Committee Chair, Representative Raúl M. Grijalva (D-AZ), where he is assisting on activities pertaining to the Committee's work on oversight and authorization of NOAA programs, as well as other matters within the Committee's jurisdiction.

National Science Foundation

Location: South Pole, Antarctica
Embedded Liaison: Lieutenant (junior grade) Timothy Holland
Members of the NOAA Commissioned Officer Corps carry out NOAA's mission in remote locations across the globe. LTJG Holland is assigned to Antarctica where he serves as the Station Chief for NOAA's Atmospheric Research Observatory (ARO) at the Amundsen-Scott South Pole Station. The ARO at the Amundsen-Scott South Pole Station is a National Science Foundation facility used in support of scientific research related to atmospheric phenomena.

Department of Defense – U.S. Pacific Command

Location: Honolulu, Hawaii
Embedded Liaison: Captain Barry Choy
The U.S. Pacific Command (USPACOM) area of responsibility encompasses approximately half the earth's surface and more than half of its population. The 36 nations that comprise the Asia-Pacific include: two of the three largest economies and nine of the ten smallest; the most populous nation; the largest democracy; the largest Muslim-majority nation; and the smallest republic in the world. The region is a vital driver of the global economy and includes the world's busiest international sea lanes and nine of the ten largest ports. By any meaningful measure, the Asia-Pacific is also the most militarized region in the world, with seven of the world's ten largest standing militaries and five of the world's declared nuclear nations. Under these circumstances, the strategic complexity facing the region is unique. CAPT Choy is linked closely with the activities within the region allowing for identification of opportunities and cooperation between USPACOM and NOAA, and better overall government function situational awareness in the region.

Department of Defense – U.S. Northern Command

Location: Boulder, Colorado
Embedded Liaison: Captain Catherine Martin
The U.S. Northern Command (USNORTHCOM) area of responsibility includes air, land and sea approaches and encompasses the continental United States, Alaska, Canada, Mexico and the surrounding water out to approximately 500 nautical miles. It also includes the Gulf of Mexico, the Straits of Florida, and portions of the Caribbean region to

include The Bahamas, Puerto Rico, and the U.S. Virgin Islands. The commander of USNORTHCOM is responsible for theater security cooperation with Canada, Mexico, and The Bahamas. The embedded NOAA liaison is linked closely with the activities within the region allowing for identification of opportunities and cooperation between USNORTHCOM and NOAA, and serves as a liaison between fostering greater situational awareness of NOAA response activities to natural disasters and Arctic activities.

Department of Homeland Security – U.S. Coast Guard

Location: Washington, District of Columbia
Embedded Liaison: Captain Kurt Zegowitz
As the NOAA liaison to the United States Coast Guard (USCG), Captain Zegowitz maintains a current and comprehensive knowledge of interagency activities and policies related to the USCG and NOAA. He identifies potential conflicts or benefits issues for analysis and evaluation, conducts appropriate assessments and studies, and serves as the interface between NOAA and the USCG. Captain Zegowitz initiates, designs, and implements strategies through federal agency liaison and coordination that results in cooperative arrangements for maritime security, oceanographic research, hazardous materials spill response, and many other activities.

Department of Defense – U.S. Navy

Location: Stennis Space Center, Mississippi
Embedded Liaison: Lieutenant (junior grade) Garrison Grant
Embedded in the Navy's Naval Oceanography Mine Warfare Center, Lieutenant Garrison Grant works side by side with Navy officers operating Unmanned Underwater Vehicles worldwide and is currently stationed at Stennis Space Center. This collaboration will provide knowledge and experience that will keep NOAA on the cutting edge of this emerging technology as well as strengthen the partnership between NOAA and the Navy.

Teacher at Sea Program

The mission of NOAA's Teacher at Sea Program (TAS) is to provide teachers hands-on, real-world research experience working at sea with world-renowned NOAA scientists, thereby giving them unique insight into oceanic and atmospheric research crucial to the nation. The program provides a unique opportunity for kindergarten through college-level teachers to sail aboard NOAA research ships and work under the tutelage of scientists and crew.

Since its inception in 1990, the program has enabled more than 800 teachers to gain first-hand experience of science and life at sea. By participating in this program, teachers enrich their classroom curricula with knowledge that can only be gained by living and working side-by-side, day and night, with those who contribute to the world's body of oceanic and atmospheric scientific knowledge. Former teacher at sea blogs can be accessed, which document their missions at sea and offer a wealth of information about the research being conducted as well as personal stories.

The 2019 TAS Field Season commenced in May. Five educators are getting underway on NOAA ships in June:

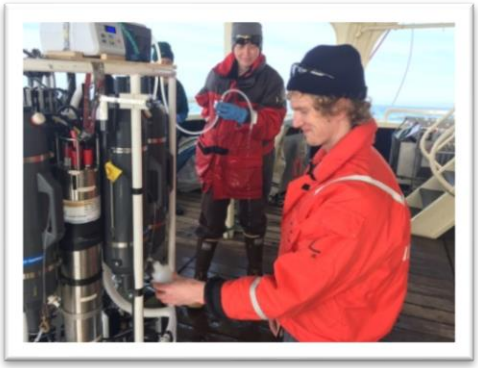
05/29/2019 - 06/07/2019 - Karah Nazor (McCallie School, Chattanooga, Tennessee) will sail on the Rockfish Recruitment and Ecosystem Assessment Survey in and out of San Francisco, California aboard NOAA Ship *Reuben Lasker*.

05/30/2019 - 06/14/2019 - Jill Bartolotta (Ohio Sea Grant, Painesville, Ohio) will sail on the U.S. Southeastern Continental Margin/ Blake Plateau Mapping Survey from Key West to Port Canaveral, Florida aboard NOAA Ship *Okeanos Explorer*.

06/03/2019 - 06/14/2019 - Lona Hall (East Hall Middle School, Gainesville, Georgia) will sail on a hydrographic survey from Seward, Alaska to Kodiak, Alaska aboard NOAA Ship *Rainier*.

06/03/2019 - 06/25/2019 - Phil Moorhouse (Armstrong High School, Richmond, VA) will sail on a Coral Reef Ecosystem Research survey from St. Thomas to San Juan, Puerto Rico aboard NOAA Ship *Nancy Foster*.

06/24/2019 - 07/15/2019 - Erica Marlaine (Nevada Avenue Elementary School, Canoga Park, California) will sail on a Gulf of Alaska pollock survey in and out of Kodiak, Alaska aboard NOAA Ship *Oscar Dyson*.



NOAA Teacher at Sea, Katie Gavenus, observes the transfer of seawater samples aboard R/V Tiglax, a US Fish & Wildlife Service vessel operating in the Alaska Maritime National Wildlife Refuge.
(Photo Credit: NOAA)

OMAO - NOAA Diving Program

Seattle, Washington

NOAA Diving Center and Program

OMAO manages and implements NOAA's Diving Program (NDP), which trains and certifies scientists, engineers, and technicians from federal, state, tribal governments, and the private sector to perform the variety of tasks carried out underwater to support NOAA's mission. NDP also has cooperative diving agreements with over 100 government agencies and academic institutions. NOAA has approximately 350 divers who perform over 8,000 dives per year and leverages its cooperative agreements to accomplish twice that number of dives contributing to scientific research. The NDP is headquartered at the NOAA Diving Center (NDC), which is located at the NOAA Western Regional Center in Seattle, Washington.

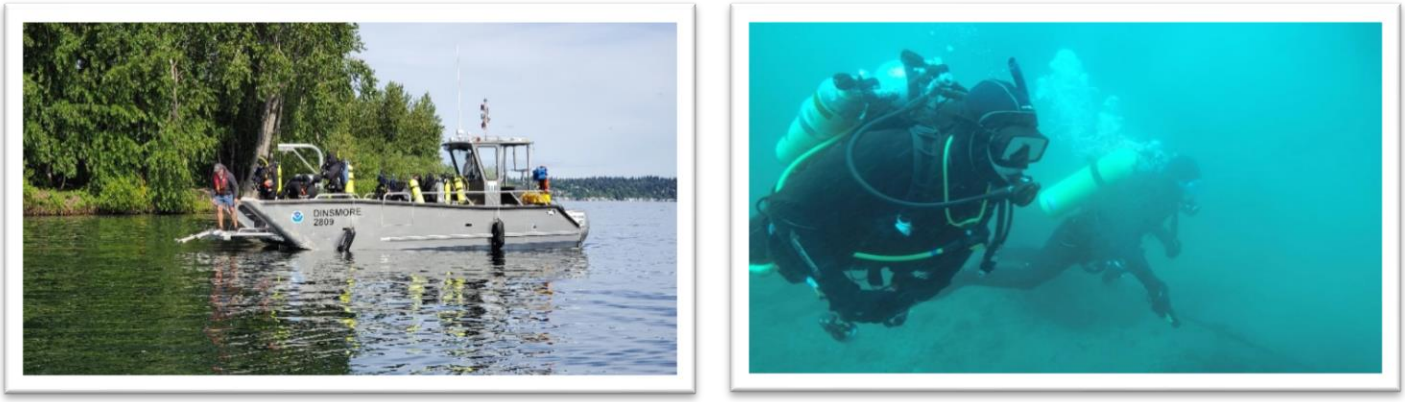
At the end of April, the NOAA Diving Control and Safety Board (NDCSB) held its annual in-person meeting in Silver Spring, MD. The NDCSB had some good discussions related to NOAA Diving policies, operational risk management, reciprocity partnerships, equipment, as well as the future of NOAA Diver training. The meeting culminated with a visit to the Naval History and Heritage Command in Washington D.C. to discuss collaboration opportunities between NOAA and the Navy. Board members also toured the Underwater Archaeology Branch to get a behind the scenes look at the preservation efforts of artifacts recovered from U.S. Navy ship and aircraft wrecks.

NDC instructor staff were also busy supporting the field and conducting training during the end of April. Zach Hileman participated on a dive-intensive project aboard NOAA Ship *Sette,* where he offered his expertise as an instructor, Divemaster and hyperbaric chamber supervisor. During his time aboard *Sette*, Zach conducted training on Hyperlite hyperbaric stretcher operations and coordinated shipboard diver rescue drills. NDC staff are often called upon for field support during dive projects where they lend their years of knowledge and experience to enhance the safety of diving operations.

(Left) NOAA Diving Control and Safety Board meets with Rear Adm. Tim Gallaudet. From left to right: LTJG Sean Digre, Lt. CDR Gary Montgomery, Roger Mays, Brian Degan, Ray Boland, RDML Tim Gallaudet, Andy David, LT Aras Zygas, LCDR Carl Rhodes, David Kowalick, Joe Hoyt, Joe Duran, and Adrain Kendrick. (Right) Jess Keller getting ready for a rebreather dive in Dutch Springs, Pennsylvania.
[Photo Credit: NOAA Dive Center]

Meanwhile Jess Keller attended a week-long training in Dutch Springs, PA to become certified in the Megalodon closed-circuit rebreather (CCR). An already experienced CCR diver, Jess attended the training to gain familiarity with the specific unit, nicknamed the 'Meg', which is utilized by many NOAA CCR divers. With the new certification, Jess has the ability to offer field support for Meg CCR divers with the possibility of working towards becoming an instructor herself.

The first three weeks of May have been busy supporting the NOAA Diver training in Seattle, WA. NOAA and Public Safety divers have been busy learning how to conduct safe dive operations. Besides the pool, students had the opportunity to dive the NDC basin in Lake Washington as well as conduct some saltwater dives in Puget Sound.



(Left) NOAA Diver Students get ready to deploy off of the NDC small boat Dinsmore for a 100’ dive in Lake Washington in Seattle, Washington (Right) NOAA Diver students hone their neutral buoyancy skills during a 70’ dive at Alki beach in Seattle, Washington.

[Photo Credit: NOAA Dive Center]

NOAA Small Boat Program

Oversight of the NOAA Small Boat Fleet is a collaboration across OMAO, NMFS, NOS, OAR and NWS. The Small Boat Program (SBP) was established in 2004 to create policies and procedures to ensure safety in support of NOAA's field operations. Direction, technical and administrative support is provided by OMAO through the NOAA Small Boat Program Office. NOAA Line and Program Offices are responsible for acquisitions, operational funding and mission support. The NOAA Small Boat Safety Board is comprised of line offices, SBP, and SECO representatives and is charged with initiating policies and training, program metrics, and compliance.

In addition to its ships and aircraft, NOAA relies on hundreds of small boats located throughout the country to complete the organization's complex and varied scientific missions. The NOAA Small Boat Program is committed to supporting the safe operation of these small boats through the principles of risk management.

The NOAA Small Boat Program manages a fleet of about 400 small boats that perform various data collection missions for NOAA throughout the United States and its territories including hydrographic surveys, fishing, diving, scientific instrument deployment/recovery, water and air quality monitoring, law enforcement and marine mammal surveys. Vessels vary in size from a simple 10-ft. kayak to a complex 85 foot research vessel. The majority of small boats fall within the range of 16-26 feet in length and operate in near-shore environments, but extended missions in deep water environments are common among the larger vessels.

The Small Boat Program utilizes the Vessel Operations Program (VOP) or Electronic Float Plan as the primary tool for NOAA to capture underway small boat activities, identify risks and collect metrics. NOAA VOP is a critical part of the safety management system and supports operational concerns at the local and national levels. Last month, an updated version of VOP went live with several enhancements and the first release of a mobile version is now operational for ease of use on the waterfront.

R/V Shearwater located at NOAA's Channel Islands National Marine Sanctuary
[Photo Credit: NOAA]

Office of Marine & Aviation Operations

Providing Environmental Intelligence for a Dynamic World

The personnel, ships, and aircraft of NOAA play a critical role in gathering environmental data vital to the nation's economic security, the safety of its citizens, and the understanding, protection, and management of our natural resources. The NOAA fleet of ships and aircraft is managed and operated by the Office of Marine and Aviation Operations (OMAO), an office comprising civilians, mariners, and officers of the NOAA Commissioned Officer Corps, one of the seven uniformed services of the United States. NOAA's roots trace back to 1807 when President Thomas Jefferson ordered the first comprehensive coastal survey. Those early surveys ensured safe passage of ship-borne cargo for a young nation. As the needs of the nation have grown, so too have OMAO's responsibilities. Today, OMAO civilians and NOAA Corps officers operate, manage, and maintain NOAA's active fleet of 16 research and survey ships and nine specialized aircraft. Together, OMAO and the NOAA Corps support nearly all of NOAA's missions.

NOAA has the largest fleet of federal research and survey ships in the nation. The fleet ranges from large oceanographic ships capable of exploring and charting the world's deepest ocean, to smaller vessels responsible for surveying the shallow bays and inlets of the United States. The fleet supports a wide range of marine activities including fisheries surveys, nautical charting, and ocean and climate studies. Based throughout the continental United States, Alaska, and Hawaii, the ships operate in all regions of the nation and around the world.

NOAA's aircraft provide a wide range of airborne capabilities. Our highly specialized Lockheed WP-3D aircraft are equipped with an unprecedented variety of scientific instrumentation, radars, and recording systems for both in situ and remote sensing measurements of the atmosphere, the Earth, and its environment. Equipped with both C-band weather radar and X-band tail Doppler radar systems, the WP-3Ds have the unique ability to conduct tropical cyclone research in addition to storm reconnaissance. Together with NOAA's Gulfstream IV-SP jet, these ‘hurricane hunter’ aircraft greatly improve our physical understanding of hurricanes and enhance the accuracy of tropical cyclone forecasts. NOAA's light aircraft also play a vital role in monitoring our environment. Our King Air, Turbo Prop Commander, and Twin Otter aircraft support marine mammal population studies, shoreline change assessments, oil spill investigations, and water resource/snowpack surveys for spring flood forecasts.

The NOAA fleet provides immediate response capabilities for unpredictable events. For example, during the 2018 Hurricane season NOAA flight crews and scientists flew a combined 556.8 hours for hurricane surveillance, research, reconnaissance, and emergency response. NOAA's Lockheed WP-3D and Gulfstream IV-SP collected and provided vital data used by NOAA scientists for improved modeling, forecasting, and ensuring accurate forecasts provided to the public. NOAA's Beechcraft King Air 350 rapidly responded to demand from emergency managers, using state-of-the-art equipment to collect thousands of aerial images from Cape Henry, Virginia to Charleston, South Carolina of damaged communities following Hurricane Florence. This imagery provided a cost-effective way to better understand the damage sustained to both property and the environment. NOAA Ship Ferdinand R. Hassler surveyed eastern North Carolina for multiple days in order to ensure vessels could safely navigate the area. This year NOAA Ship Thomas Jefferson conducted 66 days of post Hurricane Maria survey operations around Puerto Rico and the U.S Virgin Islands to support the area's recovery efforts following the destructive 2017 storm.

While manned aircraft and sea-going vessels have been, and will continue to be, a primary source of environmental data, new technology will have a significant role to play in the future NOAA fleet. OMAO, in coordination with other NOAA offices and federal agencies, is evaluating and deploying unmanned aerial and underwater systems that could significantly contribute to environmental observations. To better serve the needs of the Nation, NOAA is examining the composition of the fleet through an exhaustive and critical review of at-sea science and observation requirements. Our objective is to develop a clear, cost-efficient path forward to ensure that the NOAA fleet can continue to conduct at-sea surveys and research vital to fisheries management, updating nautical charts, responding to natural and manmade disasters, and understanding coastal and marine systems more fully. Meeting these requirements is essential to the development of sustainable, science-based management and conservation plans that protect the health and resiliency of these resources over the long-term.

We continue our efforts to build a civilian and NOAA Corps officer workforce that is uniquely qualified to gather critical environmental intelligence and be adaptive and responsive to a changing world and work to expand our partnerships with other federal agencies. For example, NOAA Corps officers are currently assigned to work in the Department of Defense, National Science Foundation, and the U.S. House Representatives among others where they lend their leadership, expertise and service. We also continue to strengthen our partnership with the Department of Homeland Security through the U.S. Coast Guard. Our basic NOAA Corps officer training class is held at the U.S. Coast Guard Academy, where newly commissioned officers train alongside Coast Guard officer candidates, developing skills and professional relationships that will benefit both services, especially during challenging times. Active collaboration the Federal family is critical to ensuring the long-term capability and success of the federal ocean infrastructure. Our partners' success is our success.

NOAA Commissioned Officer Corps

– Honor, Respect, Commitment –

The NOAA Commissioned Officer Corps is one of the United States' seven Uniformed Services and commissioned officers serve with the 'special trust and confidence' of the President. NOAA Corps officers are an integral part of the National Oceanic and Atmospheric Administration, an agency of the U.S. Department of Commerce. With an authorized strength of 321 officers, the NOAA Corps serves throughout the agency's Line and Staff Offices to support nearly all of NOAA's programs and missions. The combination of commissioned service and scientific expertise makes these officers uniquely capable of leading some of NOAA's most important initiatives. The NOAA Corps is part of NOAA's Office of Marine and Aviation Operations and traces its roots back to the former U.S. Coast and Geodetic Survey, which dates back to 1807 and President Thomas Jefferson. The U.S. Coast and Geodetic Survey Corps was founded in 1917 to provide officers to command U.S. coastal survey ships and field survey parties locally and abroad. In 1970, NOAA was created to develop a coordinated approach to oceanographic and atmospheric research and subsequent legislation converted the commissioned officer corps to the NOAA Corps. The NOAA Corps today provides a cadre of professionals trained in engineering, earth sciences, oceanography, meteorology, fisheries science, and other related disciplines. Corps officers operate NOAA's ships, fly aircraft, manage research projects, conduct diving operations, and serve in staff positions throughout NOAA. The NOAA Corps celebrated its Centennial year in 2017.

Benefits of the NOAA Corps to the Nation

The combination of commissioned service with scientific and operational expertise, allows the NOAA Corps to provide a unique and indispensable service to the nation. Discipline and flexibility are inherent in the NOAA Corps personnel system. Officers are trained for positions of leadership and command in the operation of ships and aircraft; in the conduct of field projects on land, at and under the sea, and in the air; in the management of NOAA observational and support facilities; as members or leaders of research efforts; and in the management of various organizational elements throughout NOAA. NOAA Corps officers must be technically competent to assume positions of leadership and command in NOAA and Department of Commerce programs and in the Armed Forces during times of war or national emergency. NOAA Corps officers enable NOAA to fulfill mission requirements, meet changing environmental concerns, take advantage of emerging technologies, and serve as environmental first responders. For example:

- In 2018, NOAA aircraft flew over 556 hours in support of storm reconnaissance, surveillance, research and emergency response. NOAA assets were deployed to the Central Pacific for Hurricanes Hector, Lane and Norman an performed multiple operations in the Gulf of Mexico, North Atlantic and the Caribbean for Hurricanes Chris, Florence, Gordon, Isaac, and Michael. In response to Hurricane Florence, NOAA Ship Ferdinand R. Hassler surveyed eastern North Carolina for multiple days in order to ensure vessels could safely navigate the area. NOAA Ship Thomas Jefferson conducted 66 days of post-Hurricane Maria surveys in and around Puerto Rico to support the island's recovery efforts.
- In 2017, NOAA aircraft flew over 600 hours in support of storm reconnaissance, surveillance, research, and emergency response for Hurricanes Harvey, Irma, Jose, Maria, and Nate. NOAA Ship Thomas Jefferson conducted post-storm surveys of waterways of Puerto Rico following Hurricane Maria to help re-open the ports for maritime delivery of critical supplies to the island.
- The BP Deepwater Horizon oil spill was the worst oil disaster in U.S. history. The NOAA fleet and the NOAA Corps played a major role in the response to the Deepwater Horizon oil spill. NOAA's entire Atlantic fleet and over a quarter of the total strength of the NOAA Corps were deployed to the Gulf of Mexico following this devastating event.

OMAO/NOAA Corps Resources

OMAO Sites

- OMAO
- NOAA Corps

Two Pagers, Reports, and Informational Slide Decks

- **Monthly NOAA Fleet Update** - The latest version may always be found on the Office of Legislative and Intergovernmental Affairs website [http://www.legislative.noaa.gov/policybriefs.html].
- **Monthly Aircraft Flights and Mission Info Summary** - The latest version may always be found on the Office of Legislative and Intergovernmental Affairs website [http://www.legislative.noaa.gov/policybriefs.html].
- Tornado Formation, Intensity, and Path for the Southeast United States: Research Flight and Mission Info Recap – 2018
- Hurricane Lane Flight and Mission Info Recap - 2018
- OMAO two pager with Recent Mission Highlights – 2018
- OMAO Fleet Recapitalization Slide Deck – Building NOAA's 21st Century Fleet
- OMAO Fleet Recapitalization Questions and Answers (Q&As)
- NOAA Fleet Independent Review Team Final Report
- The NOAA Fleet Plan: Building NOAA's 21st Century Fleet

Other Web Resources

- OMAO Marine Operations
- OMAO Aircraft Operations
- OMAO on Facebook
- Hurricane Hunters on Facebook
- OMAO on Twitter
- Hurricane Hunters on Twitter
- OMAO Ship Tracker - (restricted to only .gov or .mil users)